

gold in Ireland, while Salomon Reinach is not even mentioned. A little discrimination would have shown that Mr. Romilly Allen was making a curious statement (p. 293) when he said: "The bowls . . . seem to belong to the end of the Late Celtic period and the beginning of the Saxon." What becomes of the four hundred and odd years intervening between the two, when the Roman power was dominant in Britain? Such statements betray a carelessness that is not easily excused in a man of Dr. Windle's standing. The same want of precision is shown in "Hallstadt" for Halstatt, "Collie March" on one page and "Colley March" on another, the "forging" of bronze instead of "casting," and others of the same kind. In the circumstances it is a hard thing to say, but the illustrations leave much to be desired. The two figures we reproduce show diagrammatically a barrow with successive interments, and a restoration of a pit dwelling, from Mr. George Clinch's Kentish discoveries.

The book might easily have been so much better, for it has many good and useful points, that there is something exasperating in finding much to quarrel with. The index is a good and useful one, the lists of ancient remains an excellent departure, compiled with all modesty, and there is a great deal of clear treatment of some knotty questions, such as the so-called "Eolithic" period. As a series, the size of the volume is convenient and the print good, and in spite of the strictures we have felt bound to make, there is little doubt that the publishers will find a ready sale.

#### MEETING OF THE BRITISH ASSOCIATION IN SOUTH AFRICA.

THE British Association will hold its meeting this year in South Africa. In these exceptional circumstances, the general officers of the association requested the council to appoint a strong committee to cooperate with them in carrying out the necessary arrangements. This "South African Committee" has held frequent sittings, and its work is so far advanced that it is now possible to make the following announcements.

Although the annual circular and programme have not yet been issued, pending the receipt of information from South Africa, many members have already intimated their intention of being present at the meeting. The "official party" of guests invited by the central executive committee at Cape Town, and nominated in the first instance by the council of the association, numbers upwards of 150 persons, comprising members of the council, past and present general officers and sectional presidents, the present sectional officers, and a certain proportion of the leading members of each section. To this list has yet to be added, on the nomination of the organising committees, the names of representative foreign and colonial men of science, the total number of the official party being restricted to 200, including the local officials. It is hoped, however, that many other members of the association will also attend the meeting.

The presidents-elect of the various sections are as follows:—

A (Mathematical and Physical Science), Prof. A. R. Forsyth, F.R.S.; B (Chemistry), Mr. G. T. Beilby; C (Geology), Prof. H. A. Miers, F.R.S.; D (Zoology), Mr. G. A. Boulenger, F.R.S.; E (Geography), Admiral Sir W. J. L. Wharton, K.C.B., F.R.S.; F (Economic Science and Statistics), Rev. W. Cunningham; G (Engineering), Colonel Sir Colin Scott-Moncrieff, G.C.S.I., K.C.M.G., R.E.; H (Anthropology), Dr. A. C. Haddon, F.R.S.; I (Physiology), Colonel D. Bruce, F.R.S.; K (Botany),

Mr. Harold Wager, F.R.S.; L (Educational Science), Sir Richard C. Jebb, M.P.

The vice-presidents, recorders, and secretaries of the eleven sections have also now been appointed.

In view of the numerous towns to be visited by the association, and in which lectures or addresses will be given, the number of lecturers appointed is much larger than usual. The list of these, as at present arranged, is as follows:—

*Cape Town*: Prof. Poulton, on Burchell's work in South Africa; and Mr. C. V. Boys, on a subject in physics. *Durban*: Mr. F. Soddy, on radio-activity. *Maritzburg*: Prof. Arnold, on compounds of steel. *Johannesburg*: Prof. Ayrton, on distribution of power; Prof. Porter, on mining; and Mr. G. W. Lamplugh, on the geology of the Victoria Falls. *Pretoria* (or possibly *Bulawayo*): Mr. Shipley, on a subject in zoology. *Bloemfontein*: Mr. Hinks, on a subject in astronomy. *Kimberley*: Sir William Crookes, on diamonds.

As the wish has been conveyed to the council from South Africa that a few competent investigators should be selected to deliver addresses dealing with local problems of which they possessed special knowledge, a geologist, a bacteriologist, and an archæologist have been invited to undertake this work, involving in two cases special missions in advance of the main party. Whilst Colonel Bruce, F.R.S., will deal with some bacteriological questions of practical importance to South Africa, Mr. G. W. Lamplugh (by the courtesy of the Board of Education) will be enabled to investigate certain features in the geology of the Victoria Falls—particularly as regards the origin and structure of the cañon—and Mr. D. R. MacIver, who is at present exploring in Nubia, will proceed in March to Rhodesia in order to examine and report on the ancient ruins at Zimbabwe and also at Inyanga.

Most of the officials, and other members of the association, will leave Southampton on July 29 by the Union Castle Mail SS. *Saxon*, and arrive at Cape Town on August 15, the opening day of the meeting; but a considerable number will start from Southampton on the previous Saturday, either by the ordinary mail-boat or by the intermediate steamer sailing on that date.

The sectional meetings will be held at Cape Town (three days) and Johannesburg (three days). Between the inaugural meeting at the former and the concluding meeting at the latter town, opportunities will be offered to members to visit the Natal battlefields and other places of interest. Subsequently a party will be made up to proceed to the Victoria Falls (Zambesi); and, should a sufficient number of members register their names, a special steamer will be chartered for the voyage home, *viâ* Beira, by the east coast route, as an alternative to the return through Cape Town by the west coast route. Thus all the colonies and Rhodesia will be visited by the association. The tour will last 70 days *viâ* Cape Town, or a week longer *viâ* Beira (all-sea), leaving Southampton on July 29 and returning thither on October 7 or 14.

A central executive committee has been constituted at Cape Town, with Sir David Gill as chairman and Dr. Gilchrist as secretary; while local committees have been formed at Johannesburg and other important centres.

Prof. G. H. Darwin, F.R.S., is the president-elect, and among the vice-presidents-elect are the following:—the Rt. Hon. Lord Milner, the Hon. Sir Walter Hely-Hutchinson, Sir Henry McCallum, the Hon. Sir Arthur Lawley, Sir H. J. Goold-Adams, Sir David Gill, and Sir Charles Metcalfe.

Sir David Gill, Mr. Theodore Reunert, and others have taken a prominent part in the initial work. The South African Association for the Advancement of Science is cordially cooperating in the local organisation, and will join with the British Association in attending the meeting.

The aim of the council has been to secure the attendance of a representative body of British men of science, including specialists in various lines of investigation, and that, along with the generous support of the people and authorities in South Africa, should go far to ensure the success of the meeting and to stimulate local scientific interest and research.

#### THE ROYAL COMMISSION ON COAL SUPPLIES.

THE Royal Commission appointed on December 28, 1901, to inquire into the extent and available resources of the coalfields of the United Kingdom has issued its final report, which, in 38 pages, contains an able summary of the vast amount of valuable information submitted by the numerous witnesses examined. The Commission originally appointed consisted of Lord Allerton, Sir W. T. Lewis, Sir Lindsay Wood, Sir C. Le Neve Foster, and Messrs. T. Bell, W. Brace, A. C. Briggs, H. B. Dixon, J. S. Dixon, E. Hull, C. Lapworth, J. P. Maclay, A. Sopwith, J. J. H. Teall, and R. Young. Mr. A. Strahan was subsequently added to the Commission; Sir C. Le Neve Foster and Mr. Ralph Young died before the inquiry was completed.

On the whole the report is of a reassuring character. Adopting 4000 feet as the limit of practicable depth in working, and one foot as the minimum workable thickness, the commissioners estimate the available quantity of coal in the proved coalfields of the United Kingdom to be 100,914,668,167 tons, as compared with the 90,207,285,398 tons estimated by the Coal Commission of 1871, notwithstanding the fact that 5,694,928,507 tons have been raised in the meantime. The excess is accounted for by the more accurate knowledge of the coal-seams. It is also estimated that there are 39,483 million tons of coal in the concealed and unproved coalfields.

It is thought that in future thin seams will be worked more extensively than at present, and that the use of coal-cutting machines will facilitate this. The amount of unavoidable loss incident to coal-mining is a serious factor in estimating the available resources. Much coal is lost by leaving unnecessary barriers between properties, and a certain amount must necessarily remain in order to support the surface. The amount thus left might perhaps be reduced by the introduction of the methods employed on the Continent and in America of packing excavations with water-borne sand or other materials. The recovery of coal formerly abandoned might be facilitated by the establishment of central pumping stations.

The possible economies to which attention is directed comprise the adoption of coal-cutting machines, of which 483 were in use in 1902 and 643 in 1903, and the use of electricity for the transmission of power. The importance of cleaning, sizing, and sorting coal is also strongly urged, and the extended adoption of coking advocated. In this connection the advantages of by-product coke ovens are pointed out, and it is shown that washing and compression render it possible to coke many coals previously considered worthless. It is probable that briquettes will in future be more largely used for steam and domestic purposes, and there appears to be a promising field

for research for the discovery of a less smoky and less costly binding material than pitch, which is now chiefly used.

In view of the dearth of statistics of coal consumption, the following estimate for 1903 is of special interest:—

	Tons
Railways ... ..	13,000,000
Coasting Steamers...	2,000,000
Factories ... ..	53,000,000
Mines ... ..	18,000,000
Iron and steel industries ...	28,000,000
Other metals and minerals ...	1,000,000
Brick works and potteries, glass works and chemical works ... ..	5,000,000
Gas works ... ..	15,000,000
Domestic ... ..	32,000,000
Total ... ..	167,000,000

It is calculated by Mr. Beilby that in this total there is a possible saving of 40 to 60 million tons. More particularly in connection with the raising of steam there are immense economies capable of realisation. Economy in the production of power may be effected by the combustion of gas obtained as a by-product. Information submitted by Mr. Bennett Brough points to increasing opportunities of utilising blast-furnace waste gases as a source of power. Waste gases from coke ovens might similarly be utilised. Gas engines are referred to as the most economical of heat motors, but increased efficiency both thermally and mechanically is still possible. The importance of the development of producer-gas plants is strongly urged as rendering possible the utilisation of inferior coal. Interesting information is given regarding various other ways in which economies in consumption may be effected. Regret is expressed that the recommendations of the Mining Royalties Commission of 1893 and of the Departmental Committee of the Home Office in 1895 regarding mineral statistics had not been carried out. The commissioners recommend that accurate information on the coal industry should be published by one authority, and they think that it would be of great advantage if particulars of deep borings could be preserved in a Government office.

The report must necessarily attract great attention from mining engineers and economists; and it should also be carefully studied by students in mining classes. It is essentially a cautious document; and the general public will doubtless be disappointed that Lord Allerton and his colleagues have made no sensational prophecies as to the probable duration of our coal supplies, and have given no indication as to the way in which their estimate of the available tonnage of coal compares with that of other countries. Their report certainly shows that, while the coal resources are ample, the cost of coal is not likely to decrease, as the improved methods and appliances will probably be neutralised by the increased cost of working deeper and thinner seams. Where we should be glad of clearer light from the Royal Commission is on the question of the probable condition of competing coal-producing countries when the cost of production in Great Britain is considerably raised. It is futile to offer a detailed criticism of the final report until the sections containing the reports of the district commissioners, the report of the geological committee, and the minutes of evidence and appendices are published. The probable duration of the coalfields and the colonial and foreign coal resources appear to have been dealt with in special reports written respectively by Mr. R. Price-Williams and Mr. Bennett Brough, and to these the commissioners direct attention.